4.71   Line Font Definition Entity (Type 304)

Three types of line fonts may be defined. The first type considers a line font as a repetition of a basic   ECO709
pattern of visible-blank (or, on-off) segments superimposed on a line or a curve. The line or curve is
then displayed according to the basic pattern. The second type considers a line font as a repetition
of a template figure that is displayed at regularly spaced locations along a planar anchoring curve.
The anchoring curve itself has no visual purpose. The third type is specified by patterns from a
list where each pattern has an implicit meaning, and exact visual equivalence is secondary to the   ECO709
meaning of the pattern.

Any line or curve geometry entity type may reference a Line Font Definition Entity by inserting a
pointer to that entity in its Directory Entry Field 4, the line font pattern field. The type of line font
being specified is then indicated by a form number in the Line Font Definition Entity.

The preprocessor shall select one of the line font patterns (see Section 2.2.4.4.4) and place the
value in Directory Entry Field 4 of the Line Font Definition Entity. This value shall be the closest
functional equivalent or the most visually similar. The value will be used by postprocessors which
cannot support the Line Font Definition Entity. Examples of the standard line font patterns are
shown in Figure 118.

4.71   LINE FONT DEFINITION ENTITY (TYPE 304)

For the Line Font Definition Entity, the Form Numbers are as follows:

Form	Meaning
1	Line font specified by a repeating template subfigure
2	Line font specified by a repeating visible-blank pattern
3‡	Line font specified from a predefined list

Form 1: specifies that the line font type is to be a repetition of template figure displays along the referencing anchoring curve. The template figure is specified as a Subfigure Definition Entity (Type 308). In this case, four values specify the entity as follows:

- The first parameter specifies the orientation of the template displays. This may remain constant, or it may vary with the direction of the anchoring curve at the point of each template figure display location.

- The second parameter is a pointer to the Subfigure Definition Entity containing the template display.

- The third parameter specifies display locations on the anchoring curve by giving the common arc length distance between corresponding points on successive template figure displays.

- The fourth parameter gives a scale factor to be applied to the template subfigure at each display location.

Figure 116 illustrates two examples of a line font using Form Number 1. In each case, the anchoring curve is a straight line.

Form 2: specifies that the line font type is to be a repetition of a basic visible-blank pattern superimposed on the referencing line or curve. An arbitrary number of segments (M) is used in the basic pattern. When the basic pattern is laid out horizontally, the first segment is the leftmost one; the M-th segment is the rightmost one. The length (in the units of the curve on which the pattern is being superimposed) of each segment of the pattern may be specified individually. This allows the visible-blank sequence of the pattern to alternate between visible and blank regardless of the lengths of the segments but does not prohibit adjacent segments from being either both visible or both blanked when unequal lengths are employed. Another option for some patterns is to hold the length constant across segments, and achieve variation in the lengths of the visible and blanked segments by making the visible or blank segments be adjacent as required.

For example, a basic pattern whose left two-thirds is visible and whose right third is blanked, may be described either by the sequence visible-blank with the length of the first segment twice that of the second, or else by the sequence visible-visible-blank, with the lengths of all three segments equal.

The visible-blank sequence is specified by correlating it with the rightmost M bits in the binary representation of a string of hexadecimal digits, the M-th segment being associated with the units bit of the binary representation of the rightmost hexadecimal digit. A 0 represents a blank, or off segment; a 1 represents a visible, or on segment.

For this line font type, the first parameter is the positive integer M giving the number of segments in the basic pattern. Then, parameter values 2 through M+1 give the lengths of the M segments. Finally, parameter value M+2 is the minimal string of hexadecimal digits whose significance has been described above.

Figure 117 shows an example of the Form Number 2 with 5 segments of unequal length. Two repetitions of the basic font are illustrated.

ECO709 **Form 3:** specifies a line font pattern code (LFPC) from a pre-defined list. The list is given in Table 32; illustrations of line font patterns are found in Figure 119.

It is not intended that exact visual equivalence be preserved. The receiving system is to use similar but not necessarily identical patterns based on the pattern codes; the intent is to preserve the *functionality* implicit in the code. If the receiving system does not have a similar pattern, the postprocessor shall use the pattern specified by DE Field 4 of the entity pointing to this entity.